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Richard Worsam Meade
Rear Admiral U.S. Navy.

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A WINTER VOYAGE THROUGH THE STRAITS OF MAGELLAN*

BY THE LATE ADMIRAL R. W. MEADE, U. S. N.

Some twenty-six years ago I received peremptory orders to assume command of the *Narragansett* and sail forthwith to the Pacific station. We left Sandy Hook on the first blast of a nor'wester which followed on the heels of a March equinoctial, being the first steamer of the navy to leave the port of New York with stunsails set alow and aloft and no steam up. Whether it was this tribute to Boreas that brought us good fortune I do not know, but we made a famous run to the Line, where, Neptune having come on board and duly shaved and ducked several score greenhorns, our luck for the time deserted us, and for the next two or three weeks the ship fanned along with light airs and tedious calms, until the fortieth day out saw us safely in the beautiful harbor of Rio de Janeiro, tinkering away at a wretched old pair of engines which had broken down when we tried to use them to steam into harbor.

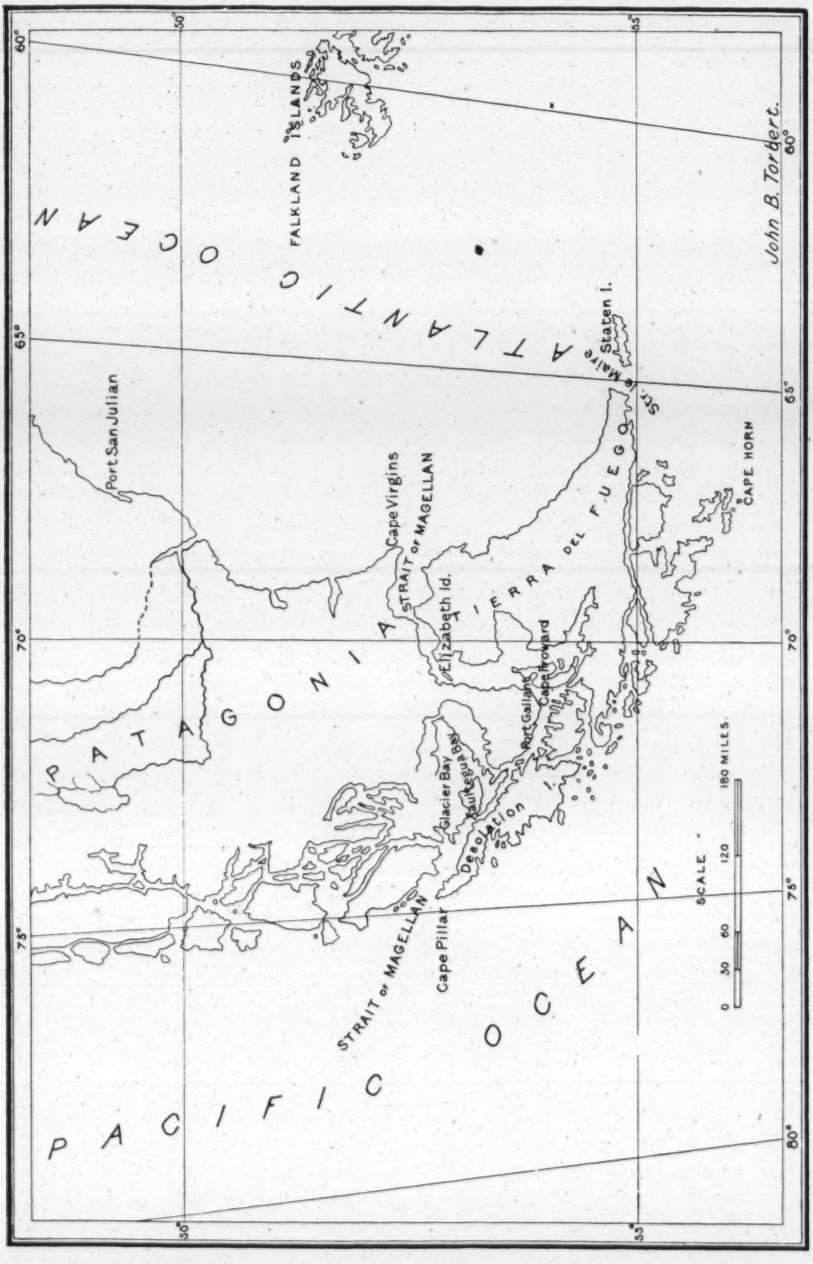
Resuming our cruise, we were favored by a sea as smooth as glass and with the most charming weather imaginable. But there is a cry of "Land ho!" from aloft, and what we see proves to be Mount Wood, a solitary peak of moderate elevation on the coast of Patagonia, and in the vicinity of the very Port San Julian where Magellan wintered his ships, about 200 miles north of the straits. As we approach the land it seems a pleasanter-looking coast than many I have seen; and though, no doubt, we

*Abstract of a lecture delivered before the National Geographic Society, December 4, 1896.

see it under most favorable circumstances of wind and weather, I incline to the belief that the popular idea in regard to the dreariness and forbidding character of the shores of Patagonia is a delusion which the commerce of the future will dispel. The day after we made Mount Wood the weather became thick and the wind squally, and, not being able to see the land, we ran by the lead. When near Cape Virgins by our reckoning the barometer commenced to rise. Now a rise in the glass in this latitude (50° south), the barometer having previously stood low, is an almost certain indication of a change of wind, if not bad weather; so all hands were called to reef topsails. Scarcely had the second reef been taken in when the wind shifted in a moment from the north landward (N.N.E. to W.S.W.) and blew in furious gusts, the horizon suddenly cleared, the mists were dispelled, the air became cold and raw, and by the rays of the setting sun (it was now 3 o'clock of a June day) we saw in the distance Cape Virgins, with its abrupt, cliff-like shore, 16 miles dead to windward of us. Thus far we had made the voyage from New York entirely under sail, ships of war not being expected to steam unless necessary. We managed, with the aid of fore-and-aft canvas, to crawl slowly to windward, and, there being a bright, full moon, crossed the great Sarmiento bank, south of Cape Virgins, where the rise of the tide is 43 feet, and by 11 o'clock that night were safely at anchor in the straits, some four miles west of Magellan's landfall.

To make our voyage intelligible it will here be necessary to describe the general character of the strait. It is safe to say that there is no other part of the world where, as a rule, the weather is so tempestuous and dangerous as it is off Cape Horn. There old Ocean exerts his full sovereignty, and the winds and the waves are almost ceaselessly raging and surging in wild tumult against a bleak, forbidding, iron-bound coast. The climate of Cape Horn is the most wretched on earth. Fierce storms of rain, hail, and snow drift in from the Atlantic, Antarctic, and Pacific oceans in everlasting succession, broken only by the furious williwaws or Cape Horn squalls.

The real difficulties of the voyage commence at Cape Froward, the southern extremity of our continent, which is 175 miles from Cape Virgins. Here the weather undergoes an entire change, and no matter how pleasant it has been before, the mariner may expect to don his "sou'wester" the moment he doubles this precipitous headland, worthy of terminating so grand a continent.



OUTLINE MAP SHOWING THE PRINCIPAL POINTS IN THE STRAITS OF MAGELLAN

For steamers and smart sailing schooners the voyage through is merely one of ordinary care and prudence, but for square-rigged sailing craft the difficulties are almost insuperable; yet one large sailing ship, the frigate *Fisgard*, went through in the astonishing time of 17 days!

From Cape Virgins to Cape Pillar the distance by the usual route is 315 nautical miles, and to traverse this from the eastward every course between W.N.W. and S.S.E. must, at one time or other, be steered, and as the wind is persistently west or southwest (or always dead ahead), the difficulties to the sailing ship are readily seen. Moreover, the character of the strait changes materially as the voyager goes west, for to the eastward of Cape Froward, as a rule, the weather is better, the sun shines brighter, anchorages are more convenient, and the dangers of navigation fewer in number.

The strait may be geographically divided as follows: (1) From Cape Virgins to Elizabeth island, the termination of the second narrows, 95 miles, where the tides are very strong, the rise and fall extraordinary (43 feet), the land comparatively low and entirely destitute of timber, the weather generally good, and anchorages safe and convenient. (2) From Elizabeth island, where trees first make their appearance and the land commences to rise, to Cape Froward, 80 miles. Here anchorages are frequent and safe, timber is plentiful, the tides are weak (not exceeding 5 feet), and the weather is comparatively pleasant. (3) From Cape Froward to Cape Quod, 50 miles, with anchorages few and far between, currents strong and in places dangerous, weather almost constantly tempestuous, mountains of great height and bare of vegetation, their peaks covered with snow or ice, natives savage and dangerous, and voyaging even in steamers attended with risk. Lastly, from Cape Quod to the Pacific, 90 miles, where there are few anchorages, and some of these, as Port Mercy, dangerous in the extreme, there is very little tide, the weather is stormy nearly all the year, and the high mountains are covered with eternal snow—the land aptly termed by Sir John Narborough "Ye Land of Desolation."

When daylight came on the morning after our arrival we found ourselves anchored off a long, low spit of shingle called by the English navigators "Dungeness," from some fancied resemblance to the headland of that name in the English channel. To the eastward was Cape Virgins, not unlike the chalk cliffs of England. To the westward loomed Cape Possession, a bold,

dark-looking headland, while to the south, dimly visible in the gray of the morning, was Magellan's Land of Fire—a low, indented coast just rising above the distant horizon. The straits are 16 miles wide at this point. Following the usual rule of the mariner in these parts, we had prepared beforehand our tables for tides, sunrise, and sunset, the light yards and topgallant masts were struck, all stunsails and booms sent on deck, and everything made snug aloft for steaming against the strong westerly winds we expected to encounter. But our apprehensions of bad weather proved groundless. The southwester had died out, and the day broke calm and comparatively clear. The sun shone out of a leaden-hued sky with just warmth enough to be pleasant, and, weighing our anchor, with a favorable flood-tide we were soon passing the land at the rate of 13 knots an hour, though the engineer would have gone wild if anyone had suggested to him the possibility of the *Narragansett's* engines driving her over 8 knots. The rise and fall of the tide in this part of the strait is very great. It is no less than 43 feet, and a singular circumstance attends the changes of the tidal stream. The flood, which runs with great velocity to the westward, commences about three hours before it is low water by the beach, and so here we were rapidly going west with the flood-tide while apparently the water was everywhere ebbing by the shore. Another feature in the tides east of Cape Froward is that the time of high water grows later as the ship proceeds to the westward, so that it is possible in a fast steamer, starting from Cape Virgins with a favorable flood, to reach the Chilean settlement at Sandy Point (110 miles) in a daylight run in June, which corresponds to our December.

As we pass Cape Possession the wind draws in fresh gusts from the northward and westward, and we set the fore-and-aft sails, which increases the vessel's speed to 14 knots. We rapidly approach the first narrows, for the low, cliff-like shores on each side are now plainly visible, and all hands are on deck to witness the terrific tide race we have heard so much about. By 10 o'clock we are fairly in the narrow pass, which is a perfectly straight "reach" of perpendicular wall-like shore, 9 miles long by 2 miles broad, with very deep water, precipitous beach at low tide, and a straight, rapid current of 8 knots an hour. We are fairly flying along the land, and by noon have made over 60 nautical miles since we started. We are clear of the narrows, dimly visible astern, and skirting the southern shore of Philip

bay. By 2 o'clock we are nearly up with the second narrows, but now the flood-tide is done, and it would be the merest folly to attempt to force the *Narragansett* through against the ebb, so we give up all hope of reaching Sandy Point this evening, and steam slowly in for the anchorage under Gregory Summit.

On the cliff abreast of the ship we observe a native camp and see some animals grazing on the downs. Soon there are other signs of life, and a dozen Indians come sweeping along on horseback. They are splendidly mounted and seem a fine, athletic race. Now they are on the edge of the bluff making signals to us, but it is too late to communicate with the shore, and, moreover, the character of "ye native" hereabouts is open to suspicion, though to do the Indians simple justice they have been rendered hostile to all white men by two centuries of brutality at the hands of the Spaniards and their descendants. As a people these Patagonians are less savage and intractable than the Fuegians or natives of the southern and western shores. There are in truth some very striking differences between these two races, and it may be well to allude to them here. In the first place, the term Patagonian, unless explained, is apt to mislead, for the whole of the continent south of the parallel of 40 degrees is known as Patagonia, and is geographically divided by the mountains into Eastern and Western Patagonia, inhabited, as far as we know, by two very different races, though Dr Darwin in his narrative of the *Beagle's* voyage in 1831 declares his conviction that they are the same race and that the present difference is caused by environment. This is probable, as food, climate, and environment are doubtless responsible for most racial differences; but, strictly speaking, the Patagonians are the natives of Eastern Patagonia, for the inhabitants of the islands along the Smyth channel (north of Magellan straits) and Western Patagonia as far as the Gulf of Peñas are of the same family as the natives of Tierra del Fuego, and are invariably designated as Fuegians. The Patagonians then inhabit the northern side of the strait east of Cape Froward and the chain of mountains known as the Southern Andes, and are probably of the same family as the Araucanians, so justly celebrated for their prowess in their encounters with the steel-clad warriors of Spain in the sixteenth century. Of these Patagonians, one explorer who passed some time with them says:

"They are very tall, finely formed, and athletic, with jet black eyes, black, coarse hair, thick lips, and a skin of reddish-brown color. They

often paint themselves in a hideous manner and then grease themselves all over. They approve the early fashions (Garden of Eden, and so on), with occasionally a mantle of skin thrown over their shoulders. They worship a god of good and a god of evil, and all that happens is considered as directly sent by one or the other of these deities. They do not believe in the final salvation of the wicked. They are averse to Christianity, uncontrollable in a state of anger, and passionately fond of strong drink. Their favorite food is horse-flesh and the blood of animals, and though they have cooking utensils they prefer to eat their meat raw. They subsist by hunting the guanaco, an animal never seen in Patagonia to the westward of Cape Froward, but very numerous on the plains of Eastern Patagonia. These people live either in camp or on horseback and do not seem to be fishermen—at least they are not known to have canoes. Their bows and arrows betoken that they live by hunting, as their arrow-heads are both poisoned and unpoisoned, and it is not at all likely they would waste the latter on their enemies. Even so late as 1871 it was said they possessed few firearms. They are a bold, warlike, and fearless race, possessing certain magnanimous traits, and in this they differ widely from the natives of the southern and western shores of Magellan straits."

The same explorer says of the Fuegians:

"They are an ugly, savage race, who in hard times become cannibals, and their most splendid feasts are characterized by dirt, filth, and misery. Christianity seems to have had no power among them."

Every one who has voyaged in these waters regards the Fuegians as treacherous and dangerous. They are short in stature and of a dirty copper-color, their only clothing, even in the coldest weather, being a sealskin or deerskin worn with the hair outward, and this solitary garment, vermin included, they will readily exchange for a little biscuit or tobacco. Darwin admits their cannibalism, which he excuses on the plea of necessity. When pressed by hunger they kill first their old women and then their dogs, because, said one of them, "Doggy, he catch otter; old woman, she no catchee otter." But usually they live by fishing and what they can gather from the rocks, as, for instance, snails and mussels, but they will eagerly devour putrid seal's flesh and the most disgusting offal.

They live in huts constructed in a very primitive way of the branches of trees, and have no articles of traffic except their weapons and implements, which are sometimes bought as curiosities. They are thievish, cunning, and greedy, and great caution is requisite in dealing with them. Attempts have been made by English missionaries to lessen their barbarism, but with no success, a fact which is the more singular, as even the

Fiji Islanders have been rendered subject to the civilizing influences of Christianity.

Captain Mayne, who recently resurveyed these waters in H. B. M. ship *Nassau*, states that "these people pass most of their time in canoes and make voyages from the straits to the Gulf of Peñas, a distance of many miles. Though usually but few canoes are seen in passing through, it is extraordinary how rapidly a hundred or more will gather together if they see an opportunity for attacking boats, small vessels, or a wreck. How the rendezvous is known is a mystery," says Captain Mayne, "but fires are seen smoking all along the coast for miles, and out of every creek a canoe will be seen shooting toward the rallying point; but there is no romance whatever about their appearance, for instead of the graceful shape of the Indian canoe, these miserable craft are simply planks tied together with thongs or fibers of trees, without the slightest regard to form, and instead of being urged along by paddles they are rowed by oars rudely made of pieces of board tied to the end of a short pole. On the bottom of the boat, in the middle, is a small fire, and on each side of it are crouched six or eight men, women, or children, according to the size of the craft. These are generally, as we have said, almost entirely naked, the women appearing to care less about clothing than the men."

A very striking difference between these people and the Patagonians was noticed by Captain Fitzroy in 1830, and subsequently by Captain Mayne in 1867. This is that while the Patagonian will generally drink all the rum he can get and is always more or less drunk when near a settlement, the Fuegian cannot be persuaded to drink at all, and if he is enticed into tasting strong liquor of any kind will always put it away with a wry face. In fact, this is the solitary redeeming trait in these savages, who are indeed to be dreaded, for they have frequently attacked and overcome the crews of passing vessels.

The next morning we were under way with the first of the flood, and steamed around Cape Gregory into the second narrows. Up to Elizabeth island the scenery was as tame and uninteresting as possible, but now for the first time we caught sight of the distant mountains to the southward, with their snowy peaks and glaciers. Passing the island, we descried the clearing above the settlement at Punta Arenas, and soon after the village was in full view, showing to much advantage its white houses and fences dotting the hillsides. It is now a colony of Chile,

originally founded as a penal settlement in 1849, when the government removed its post from Port Famine, 28 miles to the southward. A dreadful tragedy took place in 1851, the convicts rising upon the garrison, seizing several vessels, and murdering the governor and his subordinates with circumstances of atrocious cruelty, since which time the practice of sending felons here has been abandoned. The village consists of about one hundred houses built upon ground which slopes gradually back from the water. The governor was very enthusiastic about the success of the colony and showed some gold nuggets found in the little stream east of the village. The attractions of Sandy Point were insufficient to detain us long, and on the next evening we left by moonlight, steaming slowly for that magnificent headland, Cape Froward.

The morning sun shone bright and beautiful over the lofty snow-capped hills, while in the valleys, which were entirely free from snow, a flood of golden light upon the dark green foliage of the forest rendered the landscape very charming. The shore, after passing Cape San Isidro, is dotted with numerous little bays, in one of which, known as Jack harbor, the celebrated Bougainville in 1764 moored his ships and cut timber for the French colony on the Malouines, now the Falkland islands. The cove, which is hardly larger than an ordinary wet dock, is a romantic-looking nook, sheltered completely, and to add to its beauty a sparkling mountain rivulet tumbles noisily into the sea at its head.

At noon we had reached our extreme southern limit and were off Cape Froward. Though up to this time the weather had been beautifully clear and pleasant, the moment we rounded this magnificent terminus of our continent we felt a change. The bright sky gave place to an overcast leaden hued one, the air grew colder, and for the first time since entering the strait we felt the williwaw. These winds are peculiar to this region, the name being corrupted from the term "whirl 'awas" of the old navigators and seal hunters. They are rotary squalls, which blow at times with indescribable fury, seeming apparently to come from every point of the compass. There is one peculiarity about these squalls which seems to have escaped notice hitherto. This is the singularly mournful whistling sound, like the sighing of an Æolian harp, which invariably precedes and follows them.

Cape Froward, 53° 54′ S., 71° 18′ W., is the southern extremity of the continent of America. It is one of the grandest head-

lands in the world, and I say this after a lengthened experience at sea. Let those who have seen the sea face of Gibraltar imagine a thousand feet added to the rock and they will have an idea of the grandeur of Cape Froward. But we are now on the home-stretch for San Francisco as the ship doubles the pitch of the cape and edges closer and closer to the eastern shore to avoid the fury of the west wind, of the force of which the white caps and heavy sea in the middle of Froward reach give indications.

It was quite dark when the ship reached Fortescue bay and anchored. This is the most secure anchorage in the strait, and may eventually become the principal stopping-point of mail steamers. There is an outer and an inner harbor, the latter, known as Port Gallant, being accessible for ordinary steam vessels. The view from the anchorage is very fine. There are several prettily wooded islets separating Fortescue bay from Port Gallant, while Mount Cross, covered with snow, rises gradually to a height of 3,000 feet and completely overlooks the anchorage.

A few weeks before our arrival off Port Gallant it had been the scene of a tragical occurrence, the captain and three men of an English vessel, the *Propontis*, having been murdered by the Fuegians while obtaining water. On our arrival the Fuegians had apparently deserted that part of the strait. The governor had evidently deemed it impossible to apprehend the wretches concerned in these frightful murders. The fate of these unfortunate men should be a warning to small merchant vessels.

The next day was mostly consumed in making the run from Port Gallant to Borja bay, the wind being adverse and the tide strongly against us, but the beautiful scenery compensated for the tediousness of the trip; it was by far the finest that we had yet seen. The serrated ranges of mountains on Cordoba peninsula, covered with snow and glaciers sparkling in the sunlight, are very grand. The character of the strait seems to change entirely when abreast of Jerome channel, at the entrance to which Cordoba peninsula apparently blocks up the strait, which now assumes all the grandeur and beauty of an Alpine lake. The ship anchored in the deep waters of Byron's Island bay, under the shadow of Borja mountain, towering grandly 3,000 feet above our heads. A landing party soon woke the echoes of the mountain with the sharp crack of the rifle, the sound reverberating in prolonged echoes. The scenery on the mountain side is very picturesque, but the ascent is made under difficulties. The deep bay is thoroughly sheltered, and to add to its beauty three spark-

ling rivulets fall into it at different points. A peculiar feature of the place (which is a favorite post-office) is the great number of boards, nailed to the trees, which serve as a rough log of the numerous vessels that in the last fifty years have touched here. A very conspicuous one drew our attention. It read: "U. S. sloop of war *Decatur*, Dec'r 11th, 1854. All well." This ship had then been 80 days in the strait, and was finally towed through by the United States steamer *Massachusetts*, Captain R. W. Meade, father of the writer. Before leaving, the *Narragansett's* board, "5 days in the straits; all well," was nailed above the *Decatur's*.

The trees at Borja bay differ from those at some other points, being of great girth and gnarled and stunted in their growth. As soon as the moon was up, the ship steamed westward past the bold cliff of El Morion (the Helmet), and was at last fairly pointed for the great long reach to the Pacific.

The lights and shadows reflected by the moon upon the dark waters of the strait—here almost unfathomable—the dark spots under the overhanging cliffs of the lofty mountains, and the flood of silver moonlight beyond rendered the scene one of surpassing beauty. The night was calm and quiet, the stars overhead shone with the peculiar brilliancy of the high latitude, and everything promised fair for a quick run to the Pacific. At 10 next morning we had passed Glacier bay and the chill, dreary coast between it and the Spanish gulf with the unpronounceable name (Xaultegua), when a change in the weather became apparent. At 2 o'clock in the afternoon the Pacific ocean was only 35 miles off, but the long swell we now encountered and the stormy appearance of the weather compelled us to choose between a port of refuge or a stormy night in the open strait. Port Churruca, on Desolation island, seemed the best harbor, and the ship bore up for the narrow entrance. There being no bridge on the *Narragansett*, the captain took his place on the forecastle as pilot, the navigating lieutenant* held the chart, and an old sailor held a tarpaulin over it to keep it from getting wet. Careful hands were in the chains and at the engine-room bell, and all hands were called to "bring ship to anchor." The steamer was heading for two small rocky islets, about 50 yards apart, dimly visible through the sleet and mist of a driving squall. The surf broke furiously all along the rocky shore. "Slow down!" says the captain from his lookout on the forecastle, and slow it is. No soundings! In truth none could be found here with 200 fathoms of line. In a few minutes a narrow

*Now Commander Z. L. Tanner, U. S. N.

channel is descried leading apparently into the very bowels of the mountain, which towers thousands of feet above us. "Port!" from the forecastle. "Port it is, sir!" from the quartermaster at the wheel, and the ship's head flies to starboard, obedient to the helm. All hands are at their stations, both anchors ready, and the silence fore and aft is profound. We enter the passage, and the helm is alternately hard-up and hard-down as we thread our way through the narrow pass, scarce 200 yards wide, bordered by rocks and islets, upon which the sea roars and surges dismally. Now we emerge into an inland sea which in the thick weather seems almost illimitable, the shores being perpendicular walls of rock two and three thousand feet in height. The vessel turns short round to port and shoots ahead toward a little cove under the shadow of an immense mountain. "By the mark, seventeen!" comes from the chains, and the anchor is let go. Hawsers are run from the ship to one of the few stunted trees to keep the vessel clear of the rocks, and the *Narragansett* is safely sheltered for the night.

Sir John Narborough spoke soberly and truly when he named this the "Isle of Desolation." Nothing can be more grandly or profoundly desolate than the scenery in the neighborhood of Oldfield anchorage, Port Churruca. The term port is an entire misnomer, for beyond two small coves, where anchorage may be obtained in from 15 to 40 fathoms of water, there is no bottom to be found with less than 50 or 100 fathoms of line; in many places there are no soundings at all. The deep inlets of this inland sea are bordered by awful precipices, broken by frightful chasms and ravines. There are a few stunted trees along the beach, but on the mountain side not even the usual moss or lichen—nothing but bare, slate-colored, savage-looking rocks, covered with ice and snow. The place is fully sheltered, and all that night the ship lay profoundly quiet, not a breath of air stirring, though the roar of the sea and the whistling of the furious west wind outside could be distinctly heard. A party left the ship before dark to explore the head of the little cove. They found some signs of vegetation in the gully at the base of the cliff, under which the ship was moored, and one of the explorers collected a bouquet of Fuegian flowers. The sailors, however, looking rather toward the practical than the beautiful, found a bed of fine mussels, upon which we all regaled ourselves that evening.

The next morning the weather, though overcast with rain squalls at intervals, was sufficiently favorable to admit of an

attempt to leave. Some of the officers seemed dubious of the *Narragansett's* ability to clear the strait, but the captain concluded to take the chances, and at noon Cape Pillar was in sight on the port bow.

With a full head of steam and the fore-and-aft canvas the ship made good way, and at 2 o'clock passed out of the strait and steered directly west for an offing. But both the wind and sea were now rapidly rising. At dark it was blowing a furious gale from the W.S.W., with one of the most tremendous rolling seas I ever saw. No chance to run back or find an anchorage in such weather as this. At times the squalls of wind, sleet, and rain were so thick that we could not see a ship's length. There was nothing to do now but to "claw off" shore under every inch of storm canvas the vessel could carry, and trust to the engines to help us to gain an offing. At 8 o'clock that night the hatches fore and aft were securely battened down, and the lee rail of the ship was under water as she struggled under sail and steam against the storm and sea. Dimly visible astern, through the furious driving squalls, was Cape Pillar, eight miles distant. On the lee beam were the black rocks of Los Apostoles, the ship drifting slowly southward in dangerous proximity to them. The wind veered constantly from point to point, and the squalls came with blinding and terrific force; but everything held well, and the Providence which watches over "poor Jack" sent us a slant of wind which enabled us to make an offing during that dark, dismal, and anxious night.

For eight long days and nights this state of things continued, the ship vainly struggling to get to the westward, the squalls of sleet and snow never continuing long enough from southwest to enable the vessel to get north at all. On the eighth day the vessel was nearly as far south as the parallel of Cape Horn, with a fair prospect of being driven round the cape altogether. There were but a few tons of coal left, and the ship was still 1,200 miles from Valparaiso. Affairs looked blue. Many of the men were worn out, exhausted by cold and fatigue; several of the officers were in the same condition.

But all ill fortune, as all good fortune, must at some period come to an end, and so it happened that the next day the wind shifted to the south, and with strong and favoring gales the old ship went rapidly north under a press of canvas, and in ten days was safely anchored in the harbor of Valparaiso. And so ended the *Narragansett's* winter voyage through the Straits of Magellan.

ADMIRAL R. W. MEADE, U. S. N.

When the principal contents of this number of THE NATIONAL GEOGRAPHIC MAGAZINE were sent to the printer there was no indication that the gallant and accomplished author of the article "A Winter Voyage through the Straits of Magellan" would have completed the long and eventful voyage of life before his stirring narrative of one of the most interesting portions of his famous cruise in the *Narragansett* could be placed in the hands of our readers. On the first of May, however, he succumbed to the effects of a surgical operation, from which he had been supposed by his friends to have permanently rallied. It is impossible, on the eve of going to press, to present more than the briefest outline of Admiral Meade's distinguished career or to render adequate tribute to his memory. It must suffice to remind our readers of his brilliant career at college; of his becoming navigating officer of the *Cumberland* before he was 19 years of age; of his command of a naval division, engaged with the enemy, before he was 25; of the dauntless courage, good judgment, and unfailing skill that won for him, time and again, the commendations of his superior officers; of his historic cruise of 60,000 miles, mainly under canvas, in the *Narragansett;* of his success as a professor of seamanship and naval tactics; of his numerous contributions to periodical literature, and of his ever-welcome appearances before the National Geographic Society, of which he was an active member. The accompanying article contains an allusion, which we cannot regard as without significance, to "the Providence which watches over poor Jack." Himself handsome, courageous, true-hearted, and patriotic, we can say of Admiral Meade, in the words of Dibdin's grand old sea-song:

"His form was of the manliest beauty,
His heart was kind and soft;
Faithful below he did his duty,
And now he's gone aloft."

J. H.

COSTA RICA

By Señor Ricardo Villafranca,

Consul-General of the Republic of Costa Rica at San José, Guatemala

It is impossible to give within the space allotted to me a complete idea of Costa Rica, or to describe explicitly its varied resources and industries. I can but dwell briefly on the more important features of the land, the characteristics of the people, and the natural resources of the country.

The peculiarly favorable situation of Costa Rica might well be the envy of all nations, for it lies between the continents of the new world and between the earth's greatest seas; it enjoys a temperate climate, with the advantages of a tropical sun; it is one of the smallest of small nations—the true gem of American republics; its people are peaceful and law-abiding; its republican form of government, copied from the United States, is very popular; its climate is moderate, without extremes of heat or cold, and is remarkably healthful. The dreaded fevers are found only along the swampy coastal fringe and other low-lying land, of which there is little in Costa Rica. Against visionary dangers we have a land of prolonged spring and autumnal splendor—a soil upon which the flowers smile with perennial bloom.

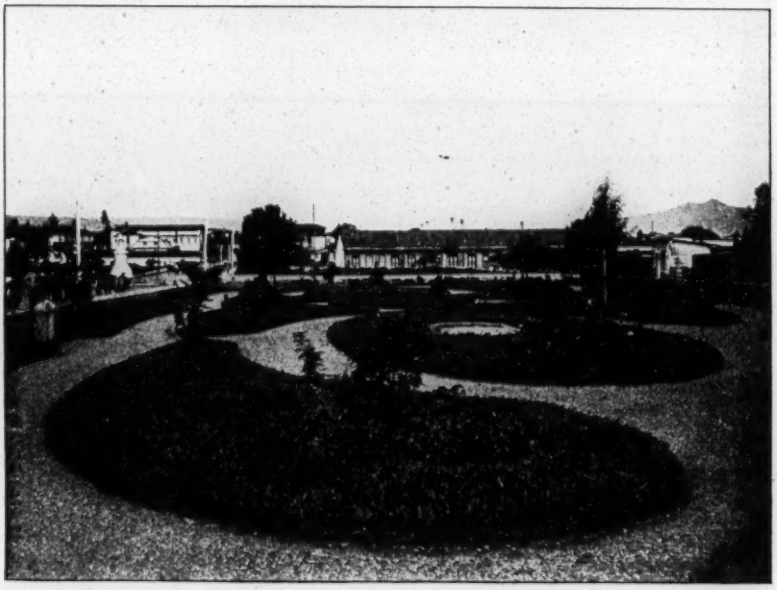
Costa Rica is feeble for want of sufficient population, but she possesses a rich store of undeveloped resources in her widely disseminated minerals and the endless productions of her fertile soil. Her forests are an incalculable natural wealth. Throughout the country the land is thickly covered with gigantic trees, among the finest in the world, and all are of a rare quality, such as mahogany, cedar, rosewood, lignum-vitæ, and a number of dye-woods, such as anatto and indigo. Little attention has been given to the forest wealth. Along the seashore, where transportation is easy, some woods have been marketed, but in the interior the trees stand as they did a hundred years ago.

In the Matina valley the Matina Banana Company is working an extensive plantation and paying large dividends. The extent of this industry cannot be appreciated except at the shipping stations. Hundreds of cars are loaded every day, and the number of boats loaded with bananas far surpasses those carry-

ing any other freight. The harvest never ends. From January to December there is a continuous cutting and marketing. One sees at the same time the budding blossoms, the young fruit, and the fully developed bananas.

Those who have seen cotton plants elsewhere, rarely attaining the height of a man, are ill prepared to see cotton trees growing to the height of 12 feet, with numberless branches, which are tipped by the snowy down. There is nothing that more clearly proves the fertility of Costa Rican soil. The bread-fruit tree is also a wonder to northern visitors. The tree is tall and massive; its branches are innumerable; its leaves large, resembling fig leaves, and the characteristic bread-fruit, of a greenish yellow color, is the size and shape of a cantaloupe. The fruit—fried, boiled, and baked, very much like potatoes—forms one of the staple foods of the working people.

The Costa Rica-Nicaraguan and Panama canals are such important projects that the nations of the earth must sooner or later complete them. Costa Rica, occupying almost entirely the territory between the two proposed canals, will ere long reap the benefit of such an unparalleled position. The Nicaraguan canal



LIMON, COSTA RICA, FROM THE PARK

will be the final event which shall make Costa Rica the true gem of American republics.

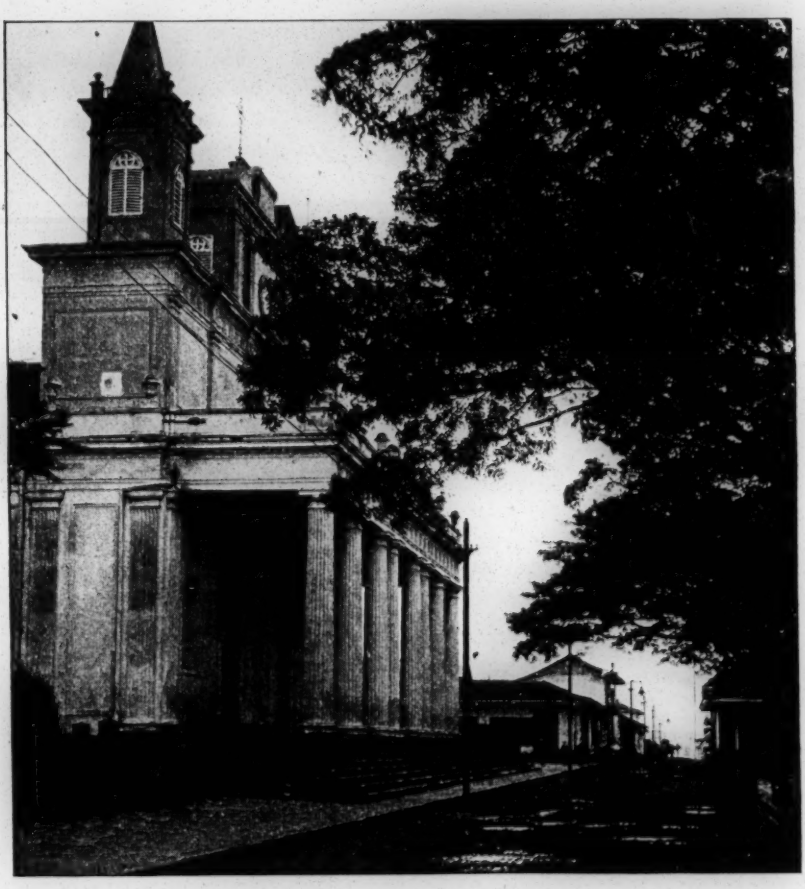
Only a few years ago a few shanties marked the present site of Limon, which today is one of the most important cities fanned by the Caribbean breezes. Rare tropical trees in the distance overshadow the most elaborate buildings, which are as a rule low; the regular streets are well kept, and the churches neat and well attended. In Central American cities great prominence is given to churches, but at Limon they are not as elegant as in more typical cities. Here foreigners are numerous, and the native population is neither wealthy nor important, but the places of worship and many of the buildings are of foreign design and foreign material. Limon has a distinctive appearance, not unlike southern settlements in the United States. English is the prevailing language, and English-speaking people conduct most of the business.

Nearly one-third of the population of the country is in the province of San José, a broad expanse containing the main coffee plantations, at short distances from the principal cities, where the owners generally live. The wealthiest, most prosperous, and most conservative of the towns are Heredia and Alajuela, which are connected with the capital by a railroad. What we shall say about San José applies more or less to all Costa Rican cities. In this magnificent neighborhood the country is studded with fruitful plantations. Here the true population of Costa Rica dwells, since here are found the hardy, simple toilers, who wrest from the earth its agricultural products—the true wealth of the soil. An air of ease combined with antique simplicity characterizes the majority of these villages. The city of San José at once gives the impression of thrift, not unlike the cities of the United States. The traveler sees two-story houses, wide sidewalks, and electric lights. In the center of Walker's park has recently been placed a handsome monument to commemorate the defeat of the filibuster Walker. Educational facilities are excellent: there are high schools, a school of law, several colleges, public libraries, etc. It is safe to say that the number of teachers in Costa Rica far exceeds the number of soldiers. The well-kept hotels, like most private residences, are built around a beautiful courtyard, from which every room in the house receives moist, cool air charged with natural perfumes of carefully cultivated flowers. Costa Ricans mingle work and play in the most delightful way; in the cities amusement is often considered more

important than business, and means of recreation are abundant. San José has a modern theater not equaled in Central America.

The Roman Catholic churches in San José, Heredia, and Alajuela are excellent indications of the wealth of the country. These churches, and particularly the Cathedral of San José, are of a design and finish that are rarely surpassed in Spanish America. The people may at times go barefoot and hungry, but the priests never lack enthusiastic support.

The home of the Costa Rican is the true pivot of life and the center of all pleasure. The houses are built around the ever-present courtyard, a garden spot which is carefully cultivated.



THE CATHEDRAL AT SAN JOSE, COSTA RICA

In it one finds flowering plants in full bloom throughout the year, and from it every room of the house has a never-ceasing current of air charged with a delightful odor.

Everybody in Costa Rica who has money and some ambition is either directly or indirectly interested in farms. The gentleman farmers are the rulers of the land. Coffee farming is the primary industry, since Costa Rican coffee has become famous and commands very high prices. Almost anywhere within a radius

A STREET IN SAN JOSE, COSTA RICA

of fifty miles one can find coffee farms, either in their infancy or in full development, with shade trees to protect the young plants. Coffee plants in bloom are among the most beautiful sights in nature. Three years after the planting of the young coffee bush it bears its first fruit. The crop increases until the eighth year; after that, for fifteen years, the crops are more or less even. In the first weeks of December the berry is of a bright red color, which indicates that the coffee is fully ripe. Every man, woman, and child is pressed into the service of picking coffee, and with

a basket swung from the waist, picks from sunrise to sunset. This operation is a delicate one, and is watched very closely to prevent the leaves from being broken, as the next crop starts from the angle formed by the leaf and branch. The fresh coffee is transported by ox carts, passes through a machine that breaks the outer skin, and is then placed for twenty-four hours in water, until the syrup-like substance that has adhered to the grains is washed away. After it has been washed, the coffee is spread out on a cemented court into smooth beds. Here it remains during the sunshine, but at night and during cloudy days it is gathered into heaps and covered with canvas. The process of spreading and gathering together is continued until the coffee is thoroughly dry. During this operation no planter neglects to place sentinels around the coffee court, since coffee even in Costa Rica is worth 40 cents a pound, and a single individual might carry away several hundred dollars' worth of it in a few hours. When dry the coffee is sacked and transported to the factory, where an elaborate process by modern machinery prepares it for the market. The final work is the separation of the black, small, and imperfect berries and classifying them. They are called first, second, third, and fourth classes, and the well-known caracolillo or peaberry. This is done by a machine having a long center cylinder, with openings of various sizes that correspond with the different classes of coffee. From this machine the berries are transferred to large tables, where girls pick out by hand any impurities not removed by the machines. The coffee is then sacked and marked; each bag weighs 132 pounds. Now that the coffee is ready for export and marked "Hamburg," "Liverpool," etc., a question naturally arises, Is there any marked "New York," "New Orleans," or "Baltimore"? I have to answer with deep regret that very little is marked that way, the bulk of the crop being bought by European firms, who send their agents several months in advance of harvest time, either to buy outright or to furnish funds, with liberal conditions, to farmers who agree to consign their crops. American merchants make very little effort to secure the products of Costa Rica or to furnish its markets with the manufactured articles which are produced in the United States.

Time does not permit me to speak of other agricultural productions. Costa Rica is capable of producing not only coffee, bananas, cocoa, and sugar-cane, but northern fruits and vegetables. There we find peaches, apples, quinces, strawberries, and

grapes, as well as tomatoes, cabbages, potatoes, corn, wheat, and other cereals. Costa Rica heretofore has not produced enough meat for home consumption, but this is not because cattle will not thrive there; it is because few intelligent attempts have been made. There is abundance of water, a perpetual verdure, and no winter necessitating feeding. Cattle of every kind and variety thrive beautifully, and that without any attention or care. Although stock farming is new and people are ill prepared to raise cattle, yet the results are excellent. Even sheep, the last animal in the world that one would expect to do well under a tropical sun, thrive and multiply with remarkable success.

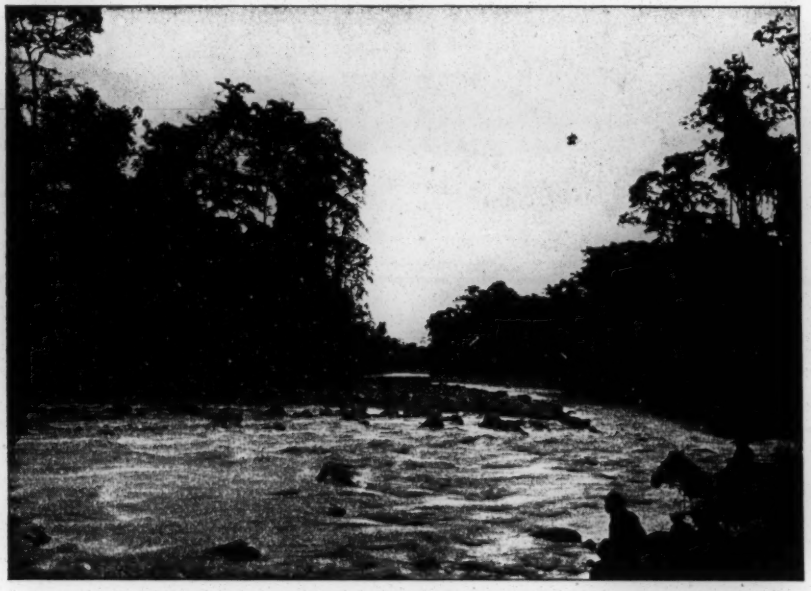
Not far from these farms are several peculiar natural springs. The most popular and interesting thermal springs today are those of Agua Caliente, which are frequented by the wealthy citizens of Costa Rica and by foreign visitors. These springs, like most natural waters, are said to be good for nearly all human ailments, but it is certain that they cure rheumatism and skin diseases. One finds among them waters hot enough to boil an egg and of a strong sulphurous odor, while, on the other hand, there are others extremely cold.

One of the unique primitive structures of the country, which portrays the characteristic ingenuity of early settlers, is the bridge made of *bejuco*, a native vine-like growth, noted for its great strength, to be noticed hanging from large trees. This strange substance is made into a rope which is hung from convenient trees near the banks of the river. The peculiar sensation experienced while crossing is far from a feeling of safety; with every step the dry, woody ropes crack and the bridge moves not only up and down, but sidewise, forward, and backward.

Entering the Indian reservation of Talamanca, fine views greet the eye of the traveler. Here are the farm-houses of half-breeds; there, colossal cocoanut trees, with large leaves, of which the roofs and sides of huts are made. The true Indian house is built on the bee-hive plan, and its framework of vine rope is thatched by palm and cocoanut leaves. Its external appearance is artistic, and the people are comfortable within. The Indians are completely isolated from civilization, are peaceful, and never give the government trouble. The men are usually well built and the women are patient and gentle. They are very thinly clad, as the climate is such that clothing is the least of their wants and is worn only with an idea of adornment. Most clothing is of the local cotton, colored by home dye-roots and certain

kinds of shells. Their beds are placed on platforms well up under the roof. The floor is the naked earth. Hammocks are strung about, always occupied, for Costa Rican Indians are not fond of work. The most interesting character in Talamanca is Antonio Sandano, the king, to whom the government accords the absolute sovereignty of the Talamanca Indians.

The rainfall of Costa Rica is somewhat greater than that of the United States. There is a dry season and a wet season every year, but the rains are never constant, nor are they ever entirely



IN TALAMANCA, COSTA RICA

absent; indeed, the atmospheric moisture is reliable and droughts never affect plants. It is well to become acquainted with a fact that seems rather curious in reference to rain; it is the one that attracts the attention of foreigners, who in visiting Central America expect to see rain pouring down constantly. The rain begins at about 2 o'clock in the afternoon, continuing from a half hour to three hours. But what rain! It seems as though the dikes of the heavenly reservoirs had been torn asunder. Another peculiarity still, when it rains on the eastern slope it is clear on the western, and *vice versa*.

To visit the successful mining camps in Costa Rica one has to ride over rough roads, crossing bridgeless rivers, and traversing thick forests, where mahogany, cedar, rubber, and other tropical trees cover the earth and screen the skies. The journey is long and at times tiresome, but to see gold at the end of the journey mingling with the best of mother earth more than repays for the discomfort of travel. Here is a region of incomparable mineral richness, but up to the present the mines have been worked in a most primitive way, necessitating great labor and expense. With the importation of new labor-saving machines and improved mining methods there is no doubt that we shall soon see golden streams flowing from the depths of Costa Rica.

Throughout the Republic transportation is largely conducted by caravans, with ox teams as the motive power. The carts are heavy, primitive vehicles made by the peasants, the wheels being solid circular disks cut from the stems of large trees. The oxen are always objects of regard, as their drivers and owners have an almost supernatural love for them, and often prize them more than they do their own wives.

The railroad from San José to the Pacific coast is partially completed and passes through a fertile agricultural country and several towns, among them Alajuela, with its extensive market. At Alajuela we leave behind us the train and reach Esparta, twelve miles away from Puntarenas, by mules. From Esparta, one of the oldest towns in Costa Rica, we again take the train to Puntarenas. This is the principal seaport on the Pacific and is connected by steamer with San Francisco.

It must be plain that Costa Rica offers industrious immigrants exceptional advantages. Men who can begin life on a plantation or in one of the many industries with a few hundred dollars can in a few years accumulate a reasonable property, secure a permanent home in a region surpassed nowhere in the world for healthfulness, and lay the foundation for an estate which is certain to increase rapidly in value. Costa Rica is indeed a land of promise to all interested in securing for themselves a future prosperity; it is a land upon which greater nations will ere long be casting their ambitious eyes.

[The illustrations accompanying the foregoing article are from photographs kindly placed at the disposal of the editor by Señor Don Joaquin B. Calvo, Costa Rican Minister Resident at Washington.]

APPLIED PHYSIOGRAPHY IN SOUTH CAROLINA

By L. C. Glenn

An interesting physiographic change is now going on in much of the Piedmont section of South Carolina and other cotton-growing states, the consequences of which are becoming grave to the owners of the soil and are threatening soon to result, unless checked by a proper observance of physiographic laws, in the destruction of much of the most fertile land of the region—a destruction already wrought in many cases. The change referred to is the exceedingly rapid aggradation by the streams as a result of a system of farming that has recently come into vogue in that region.

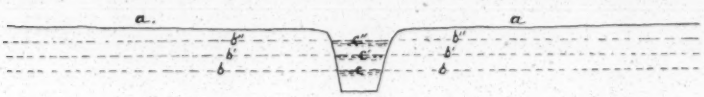
This Piedmont section is an old peneplain that has been uplifted and is now well dissected by the many streams that have cut their way down into the plateau from fifty to a hundred and fifty or more feet below the general level. In some places rapids and falls still occur, but for the most part the streams are at grade and rapid down-cutting has ceased, while lateral swinging has widened the valleys and bordered the banks with large tracts of rich alluvial "bottom land." On these bottoms chiefly the corn of the country has heretofore been raised, while the hillsides and interstream upland are devoted to the culture of cotton.

Before the first settlement of the country the forest-clad slopes furnished waste to the streams very slowly and they were able to erode for themselves deep channels and keep their valley floors well drained. Although the country has been settled over a hundred years, the system of farming common before the war did not so materially increase the amount of waste furnished to the streams from the hill slopes as to overload them and endanger the fertility of the bottoms. When a field became too poor for profitable cultivation it was turned out to grow up in old-field sedge and fresh land was cleared. In this way either much of each stream basin was in original forest or vegetation covered old fields, both of which fed the rainfall to the streams slowly and furnished only a moderate amount of waste.

Since the war the use of commercial fertilizers has become general in this region. By their application these worn-out old fields have again become capable of producing paying crops and have

been plowed and planted in cotton. The successful growing of this crop requires such clean culture that, in the almost total neglect of crop rotation, the soil is soon deprived of nearly all its vegetable matter, while the cotton plant furnishes far too few root fibers to hold the soil together and prevent it from washing down into the valleys. When to this is added the fact that terrace plowing is almost unknown, it is readily seen that the rain falling on these slopes rapidly gathers into hillside gullies and quickly finds its way down to the effluent stream, carrying with it an immense amount of detritus. The stream is now overloaded, and does the only thing possible under the circumstances—it drops the portion of its load that it is unable to carry. Thus the channel that of old was often five to ten feet deep is soon filled until it is scarcely more than twice so many inches in depth. With every heavy rain the stream now overflows its banks, covers the rich flood-plain soil with barren sand, and spreads desolation over almost its entire area. In the case of small streams the waste has been showered down from the valley sides during heavy rains in such quantities as, in many instances, to completely fill the stream's channel and leave it to wander as an outcast hither and thither over the surface which it formerly drained and rendered fertile, but on which it now aids in producing marshes and malaria—in just retribution, as it were, for its owner's neglect of physiographic laws.

It might be well to note more fully the regular cycle of change through which the flood-plain passes before assuming the completely wasted state. As the stream bed begins aggrading, overflows become easier and hence more frequent; the mouths of the artificial drainage ditches leading from the flood-plain into the stream channel soon silt up; the drainage becomes poor, and as a consequence the land is longer after overflows in becoming sufficiently dry for cultivation. As the aggradation



gradually raises the stream surface nearer the surface of the flood-plain (c, c', c''), the water level in the land on either side of the stream rises, *pari passu*, nearer the land surface (b, b', b'') and thus constantly decreases the distance through which capillary attraction must act in raising water to the plant roots, and hence makes the land wetter and wetter until finally the culture of corn must be abandoned. Though now too wet for cultivation,

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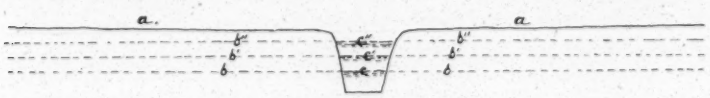

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the land may yet for a short time furnish a rather poor meadow, since comparatively little of the rich alluvial surface has yet been covered by the sand, most of which has been disposed of in filling the stream channel. It is as though the stream realized its inability to directly attack the surface at first and so turned its attention to preparations for a more effective attack a little later by filling its channel with sand and thus placing itself in a position to rapidly complete the work of destruction when it has once actively begun. When it has built up its bed almost even with the flood-plain surface level this work of preparation ends and the work of direct destruction begins. Every overflow now cuts channels that lead away from the main stream, and spread sand far and wide over the plain, burying the fertile soil. As the depth of the sand increases, the flood-plain becomes more barren, until it is finally a waste of sand thinly overgrown with nettles and other sand-loving plants, while willows fringe the branching channels of the wandering stream, and here and there along the margins of the wasted plain and in other chance low places water collects and forms marshes that are soon overgrown with reeds and rushes. The cycle of destruction is now complete.

Thus in some sections much of the formerly fertile "bottom land" has already been abandoned as worthless, much more can scarcely be cultivated profitably, while but little is so favorably situated as to escape entirely the ruinous effect of the continual clean cultivation of the hill slopes.

The remedy for this destruction is so simple and self-evident to the student as hardly to require statement; the cotton crop must be rotated with some crop that will furnish an abundance of root fibers to hold the soil together and prevent it from washing, and the hill slopes must be terrace-plowed. If this is done the degradation of the hill fields and the aggradation on the bottom fields will be checked; if this is not done all the most fertile land will soon become but barren wastes.

Mention may be made of a lake of aggradation of the Red river (Louisiana) family, to be found in the northwestern part of Fairfield county, S. C., since it is due to the same general cause. From a broad open valley there runs back into the upland a broad side valley that contained a weak stream draining but a small area. When the master stream began aggrading, it set a pace with which the side stream could not keep up. Its mouth was sealed up, and it was forced to lake itself before gaining an exit, thus covering to a depth of eight or ten feet a considerable area that before the war had been planted in corn.

SHEIK SAID

The Société de Geographie, of this city, has just published a fine map of Africa. On looking over it I noticed that Sheik Said, on the south coast of Arabia, was given as French territory. This surprised me, as Philip's map of the Nile valley gives it as an English possession, making Aden the center of a large territory, extending to and including Sheik Said. On consulting a German map I found it given neither as English nor French, but as a part of the province of the Yemen, and therefore Turkish. I then called on M. Gauthiot, general secretary of the Commercial Geographic Society, who informed me that it was positively French territory, although wrongfully occupied by a Turkish garrison. M. Gauthiot having suggested certain authentic sources of information, I proceeded to make further investigations, and in view of the growing interest in eastern affairs I venture to submit the result to the readers of THE NATIONAL GEOGRAPHIC MAGAZINE.

The territory of Bab-el-Mandeb was well known in antiquity. On its southern side was the important port of Okelis. The fall of the Roman power in Egypt and the Red sea brought also that of Okelis, whose ruins are still visible, and trade with India went by way of the Persian gulf. When, under the Sultan Selim the First, the Red sea regained its importance, it was Aden that was selected as the chief port. Since the downfall of the Kalifate the territory of Bab-el-Mandeb has been left to govern itself. It is inhabited by the tribe of the Akemi-ed-Dourein, who have always held their independence against the Turks. This independence was indirectly recognized both by Turkey and by England. It was of the sheik of the Akemi-ed-Dourein that the governor of Aden asked permission to dig wells on the territory of Bab-el-Mandeb to obtain water for the garrison of Perim. A Turkish vessel having been wrecked on the Arabian coast south of Mokha, it was to this same sheik that her owner applied for help. In 1863 an English vessel was wrecked on the coast of Bab-el-Mandeb and looted by the natives. The English governor of Aden applied to the kaimakam of Mokha for redress, but the kaimakam said he could do nothing, as the Turkish authority did not extend south of Mokha.

In October, 1868, the firm of Raband & Bazin, of Marseilles, entered into negotiations with the sheik of the Akemi-ed-Dourein, Ali Tabatt, and purchased from him a part of the territory of Bab-el-Mandeb, including the bay of Sheik Said and about 400,000 acres of land adjoining. Naturally England did not like to see France take possession of so important a strategic point, but, not wishing to openly oppose France, she is said to have stirred up Turkey to claim it as included in her dominion. Accordingly a small Turkish garrison landed in Turks' bay to take possession of Sheik Said, but, warned by the French consul at Aden, the French ship *Bruat* was immediately dispatched to protect the small colony of Sheik Said. Early in 1870 the firm of Raband & Bazin erected a two-story building and began to lay in coal supplies. A few weeks later the

Franco-Prussian war broke out, and England, having declared her neutrality, refused to allow French ships to coal at Aden. The French government then officially took possession of Sheik Said by making it a coaling station and a refuge for French warships. After the treaty of Frankfort Sheik Said was abandoned. Raband & Bazin continued to occupy it for some time, but finally withdrew, after lodging a declaration as to their rights and ownership with the Turkish authorities. In 1884 the French press again took up the subject, and the government sent out some surveyors and engineers, who found the place occupied by a Turkish garrison. In 1885 the Turkish government officially announced its occupation by a notice published in a newspaper of Sana, the capital of the Yemen.

It is very evident that the occupation—I mean a thorough military occupation—of Sheik Said would be of the highest importance to France in view of the enormous development of her colonial empire, and especially of England's continued occupation of Egypt. The way to the Indian ocean and the far East has become almost as important to France as it is to England, and it is hardly fair that one nation should possess all the keys to the gates of the famous waterway to the exclusion of all other nations. France's present occupation of the territory of Obok, on the west side of the Straits of Bab-el-Mandeb, with the port of Djibouti, is very good as a commercial position, but as a strategic point it can only acquire importance by the addition of Sheik Said on the east side.

This incident of Sheik Said furnishes an example of inaccurate map-making by men who are apparently more zealous and patriotic than learned and accurate. Whatever may be said of the claims of France to the territory in question, it does not appear that England has ever had the shadow of a claim to it, and Mr Philip ought to know that the use of a brush and some color to make a territory appear to be either English, French, or Turkish, according to one's patriotic ambitions, does not make it so. Geographers ought certainly to stick to official facts and not mislead by marking on their maps unofficial and inaccurate boundaries.*

ERNEST DE SASSEVILLE.

PARIS, *April 12, 1897.*

GEOGRAPHIC LITERATURE

Bulletin of the Department of Labor. No. 9. Edited by Carroll D. Wright, Commissioner; Oren W. Weaver, Chief Clerk. Pp. 109–236.

Rand, McNally & Co.'s Road Maps and Cycling Guide to Westchester County, New York. Chicago and New York: Rand, McNally & Co. 50 cents.

Magnetic Declination in the United States. By Henry Gannett. From the Seventeenth Annual Report of the U. S. Geological Survey. Washington, 1896. Pp. 203–440, with map and diagrams.

Statistical Abstract of the United States. 1896. Nineteenth number. Prepared by the Bureau of Statistics, under the direction of the Secretary of the Treasury. Pp. XII + 400. Washington, 1897.

*In the Times Atlas, London, 1896, Sheik Said is distinctly marked as a French possession. J. H.

The Foreign Commerce and Navigation of the United States for the year ending June 30, 1896. Prepared in the Bureau of Statistics, U. S. Treasury Department. Worthington C. Ford, Chief of Bureau. Vol. I, pp. I-CXLVII + 1-760; vol. II, pp. 761-1432.

It is rarely that the bimonthly Bulletin of the Department of Labor fails to present some useful contribution to the literature of economic geography. Two articles in the March number are worthy of note in this connection: The Padrone System and Padrone Banks, by John Koren, and The Dutch Society for General Welfare, by Prof. J. Howard Gore, Ph. D., of the Columbian University.

Nothing could better illustrate the extraordinary popularity of cycling than the publication for the express use of wheelmen of the attractive handbook and large-scale road maps of Westchester county, New York, recently issued by Rand, McNally & Co. While the easy accessibility to an immense population of the interesting and delightful region described will no doubt fully justify the publishers in their venture, the publication is none the less a notable one and worthy of high commendation.

Henry Gannett, whose versatility of mind as a geographer, statistician, and diligent investigator in many other lines of scientific inquiry is continually enriching our technical literature, has compiled for the Annual Report of the Geological Survey an elaborate series of tables and diagrams relative to the variation of the compass. While the chief aim of the author has been to show the approximate declination for the year 1900 at 22,000 different points in the United States, he gives us an interesting historical review of the secular variation and briefly notices the various other changes to which the magnetic declination is subject.

The high standard of excellence that has characterized the publications of the Bureau of Statistics of the Treasury Department under Mr Worthington C. Ford is fully maintained in the Report on the Foreign Commerce and Navigation of the United States for the fiscal year 1895-'96 and in the new number of the Statistical Abstract. The latter is more comprehensive and correspondingly more valuable than ever before. In a country whose official statistical publications are as voluminous as those of the United States, such an abstract is indispensable, and the provision made by Congress for its publication should be such as to admit of a careful analysis of such statistical data as may from time to time become available and of an absolutely accurate presentation of them in a summarized form.

J. H.

GEOGRAPHIC SERIALS

The Journal of the Royal Colonial Institute for April contains a valuable paper on "The Dairy Industry in the Colonies," by Mr Samuel Lowe.

The Scottish Geographical Magazine for April contains an excellent physical and political description of Ceylon by Mr L. B. Clarence and an historical article treating of "The British in South America" by Colonel Howard Vincent.

The Geographical Journal for April contains several articles of interest, including "The First Crossing of Spitzbergen," by Sir W. Martin Conway; "Two Years' Travel in Uganda, Unyoro, and on the Upper Nile," by Lieutenant C. F. S. Vandeleur; "The Southern Borderlands of Afghanistan," by Captain A. H. McMahon; "The Perso-Baluch Boundary," by Colonel Holdich, and "The River Oder." The last article of the volume is by Professor A. W. Andrews on "The Teaching of Geography in Relation to History." This article has a special interest to members of the National Geographic Society, inasmuch as it is in line with the course of afternoon lectures recently completed.

The Journal of the Manchester Geographical Society, January–March, opens with an article entitled "The Mendi Country and Some of the Customs and Characteristics of its People," by Rev. William Vivian. This is a little known region between Sierra Leone and Liberia. Sir W. Maxwell contributes an article on the Results of the Ashanti Expedition in 1895-'96, which is supplemented by a description of the Niger River and Territories, by Major Hampden Jackson. The work of the Hausa Association is summarized by Rev. W. Robinson, in a paper read at the Liverpool meeting of the British Association and published here. The Botany and Zoölogy of Uganda and other parts of Equatorial Africa are the subject of papers by Rev. F. C. Smith, and the number concludes with an excellent article on Queensland, by General Sir Henry W. Norman.

The *Transactions of the Liverpool Geographical Society* for the year 1896 include several interesting and valuable papers. The first, entitled "Railways in Africa," by Major Darwin, describes not only the existing lines of railway, but the lines of water communication and the railway routes needed in the future. Miss M. H. Kingsley writes on the "Ascent of Cameroons Peak and Travels in French Congo," the narrative of an interesting journey. Mr Gray Hill writes the narrative of "A Journey to Petra," and Mr W. A. L. Fletcher of "A Journey Toward Llassa." Mr J. C. Ernest Parkes gives a short description of "The Man-Eating People of the Imperri," and Mr James Irvine furnishes a "Description of the Kingdom of Benin," written about the year 1630 and abridged from the folio edition of John Ogilby, published in 1670. The volume closes with a summary of the scientific results of Dr Nansen's North Polar Expedition, by Professor Mohn.

The April *Bulletin of the American Geographical Society* is an exceptionally interesting number. Mr Cosmos Mindeleff writes on "The Influence of Geographic Environment," discussing its application to the Pueblo Indians of New Mexico and Arizona. Dr George M. Dawson summarizes, in two and one-half pages, the "Geographical Work in Canada" in the year 1896. Professor R. S. Tarr continues his series of papers on "The Physical Geography of New York State." Mr James Douglas furnishes an historical article entitled "The Consolidation of the Iroquois Confederacy," and Mr Francis C. Nicholas contributes a paper upon the "Economic Importance of Geological and Physical Conditions in Tropical America." The Washington letter of Mr F. H. Newell contains an admirable summary of the situation regarding forest reserves. The "Record of Geographical Progress" is exceptionally full, and this, with Map and Book Notices, closes the number.

Among the recent publications in the Johns Hopkins University Studies is one entitled "The Street Railway System of Philadelphia, its History and Present Condition," by Dr Frederic W. Speirs. The street railway system in that city commenced in 1858, when the first line was opened. The history of the development of the system was probably very similar to that of other American cities, extensions being sought by railway companies and promoters and strenuously opposed by the majority of the people living upon the threatened streets. In 1876 the system had grown until it comprised 289 miles, operated by 17 separate companies, which were associated in a pool, under the control of a board of railway presidents. In 1880 the current began to set strongly toward monopoly, and the movement went on, until in 1895 all the mileage of the city, amounting to 430 miles, was in the hands of four companies, and in 1896 the Union Traction Company, a new company formed for the purpose, obtained control of all the lines of Philadelphia, with the exception of one short line, 24 miles in length, the Hestonville, Mantua and Fairmount road. Besides giving a history of the lines, the paper treats *in extenso* of the financial aspect of the system, the price of franchise privileges, the principal item of which is the paving of the streets, estimated by the Bureau of Highways at $9,000,000. It contains a chapter on the public control of the railway system and upon municipal ownership and corporate influence in the city government. "The Relations of the Railways to their Employés" is treated in a separate chapter.

H. G.

PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY, SESSION 1896-'97

Special Meeting, March 29, 1897.—Fifth Monday afternoon illustrated lecture. President Hubbard in the chair. Prof. Benj. Ide Wheeler, of Cornell University, lectured on Greece.

Regular Meeting, April 2, 1897.—Vice-President Gilbert in the chair. Mr H. M. Wilson and Mr Isaac Winston described instruments and methods used in spirit-leveling by the U. S. Geological Survey and the U. S. Coast and Geodetic Survey respectively. Illustration by instruments, maps, and diagrams.

Special Meeting, April 5, 1897.—Sixth Monday afternoon illustrated lecture. President Hubbard in the chair. Rev. Dr Alex. Mackay-Smith lectured on Rome.

Special Meeting, April 9, 1897.—President Hubbard in the chair. Vice-President Merriam read a paper, with lantern illustrations, on the Effects of Geographic Environment on Animal Life.

Special Meeting, April 12, 1897.—Seventh Monday afternoon illustrated lecture. President Hubbard in the chair. Prof. Edwin A. Grosvenor, of Amherst College, lectured on Constantinople.

Regular Meeting, April 16, 1897.—Secretary Gannett in the chair. The paper for the evening was on the Secular Variation of the Magnetic Dec-

lination in the United States, by the chairman, with maps and diagrams, followed by an address by Mr G. W. Littlehales on the Magnetic Compass in Modern Navigation.

Special Meeting, April 19, 1897.—Eighth Monday afternoon illustrated lecture. President Hubbard in the chair. Prof. Wm. H. Goodyear, of the Brooklyn Institute of Arts and Sciences, lectured on Venice and Genoa.

Special Meeting, April 23, 1897.—President Hubbard in the chair. Dr T. C. Mendenhall, President of the Worcester Polytechnic Institute, lectured, with lantern illustrations, on Weighing the Earth.

Special Meeting, April 26, 1897.—Ninth, and last, Monday afternoon illustrated lecture. President Hubbard in the chair. Dr David J. Hill lectured on America. After the lecture a number of lantern illustrations of American scenery were thrown on the screen by Mr B. P. Murray.

Regular Meeting, April 30, 1897.—President Hubbard in the chair. Hon. Martin A. Knapp, Commissioner of Interstate Commerce, read a paper, with lantern illustrations, on Some Geographic Effects of Modern Methods of Transportation.

ELECTIONS.—*March 26.*—J. M. Boutwell, Pay-Inspector A. Burtis, U. S. N., Col. R. M. Calhoun, Lieut. G. B. Harber, U. S. N., E. T. Parsons, Louis R. Peak, Powhatan Robertson, Hon. N. D. Sperry, Wallace Streator.

April 9.—Capt. John Callahan, Rev. Asa S. Fiske, Miss L. N. Forrest, Lieut. F. M. Kemp, U. S. A., Mrs Porter King, W. A. McFarland, Wm. A. McKenney, Dr Grace Roberts, Miss Grace C. Sheldon, Miss Mary A. Spencer, Julius Ulke, Jr.

DEATHS.—Major Charles E. Bendire, U. S. A.; Rear-Admiral Richard W. Meade, U. S. N.

MISCELLANEA

The map of the United States published by the General Land Office in 1896 represented in broad lines the original territory of the United States and the several accessions made to it by purchase or otherwise. Among the mistakes perpetuated by this map is that of representing "Oregon," *i. e.*, the present states of Oregon, Washington, Idaho, and part of Montana, as a portion of the Louisiana purchase. This mistake is taken as a text by Colonel James O. Broadhead for a critical review entitled "The Louisiana Purchase; Extent of Territory Acquired by the Purchase," published by the Missouri Historical Society. Colonel Broadhead shows most conclusively that Louisiana extended on the northwest only to the limits of the Mississippi drainage basin. The conclusion is not a new one, but we are obliged to Colonel Broadhead for many new items of evidence. If anything were needed to settle the matter beyond peradventure, the proofs which he brings forward should be conclusive.

H. G.

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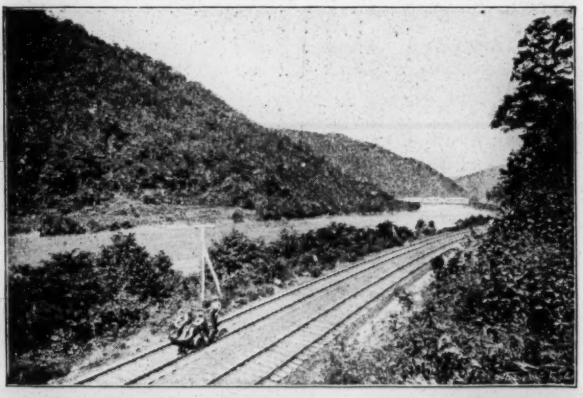

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1					1
2					2
3					3
4					4
5					5
6					6
7					7
8					8
9					9
10					10
11					11
12					12
13					13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
TOTALS					TOTALS

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